

CLAIMS LISTING

- 1) (Currently amended) An improved separation element of a corn head row unit comprising:
 - a. a source of power for rotation,
 - b. at least two opposing stalk rolls connected to said power source,
 - c. said stalk rolls having at least one flute,
 - d. said flute having at least one penetration point; and,
wherein said penetration point is composed of hardened material.
- 2) (Currently amended) An improved separation element of a corn head row unit comprising:
 - a. a source of power for rotation,
 - b. at least two opposing stalk rolls connected to said power source,
 - c. said stalk rolls having at least one flute,
 - d. said flute having a knife edge; and,
wherein said entire knife edge is composed of hardened material.
- 3) (Previously Presented) The separation element of said corn head row unit according to claim 2 wherein the knife edge has a predetermined surface slope.
- 4) (Previously Presented) The separation element of said corn head row unit according to claim 3 wherein the knife edges have a forward slope relative to the direction of rotation of each of said stalk rolls.
- 5) (Previously Presented) The separation element of said corn head row unit according to claim 4 wherein the knife edges of opposing flutes have a predetermined surface slope and the angle of said slopes of opposing flutes are identical.
- 6) (Previously Presented) The separation element of said corn head row unit according to claim 2 wherein the opposing flutes are tapered.
- 7) (Previously Presented) The separation element of said corn head row unit according to claim 2 wherein the opposing flutes intermesh.

- 8) (Previously Presented) The separation element of said corn head row unit according to claim 2 wherein the radius of the opposing flute surfaces is reduced in discrete increments along the length of the stalk roll.
- 9) (Previously Presented) The separation element of said corn head row unit according to claim 2 wherein the opposing flutes surfaces have a plurality of radii along the length of the stalk roll.
- 10) (Previously Presented) The separation element of said corn head row unit according to claim 2 wherein the radius of the leading edge of the flute is less than the trailing edge of the flute in relation to the direction of rotation of the stalk roll.
- 11) (Cancelled)
- 12) (Cancelled)
- 13) (Cancelled)
- 14) (Cancelled)
- 15) (Cancelled)
- 16) (Cancelled)
- 17) (Cancelled)
- 18) (Cancelled)
- 19) (Cancelled)
- 20) (Currently Amended) An improved method of engaging corn plants with a corn head row unit comprising the steps of:
 - a) engaging the corn plant with a plurality of rotational elements,
 - b) pinching the corn plant between said rotational elements,
 - c) penetrating the corn plant stalk with said rotational elements a pre-determined penetration depth, wherein the pre-determined penetration depth of each of said rotational elements is less than half the diameter of the corn plant stalk,
 - d) pulling the corn plant stalk with the rotational elements,

- e) said penetrating, pinching and pulling steps repeatedly lacerating the corn plant stalk along its length and width; and,
- f) separating the corn plant ear from the corn plant stalk and husk.

21) (New) An improved separation element of a corn head row unit comprising:

- a. a source of power for rotation,
- b. at least two opposing and parallel stalk rolls connected to said power source,
- c. said stalk rolls having at least one flute,
- d. said flute having a knife edge; and,

wherein said entire knife edge is composed of hardened material.

22) (New) The separation element of said corn head row unit according to claim 21
wherein the knife edge has a predetermined surface slope.

23) (New) The separation element of said corn head row unit according to claim 22
wherein the knife edges have a forward slope relative to the direction of rotation of each of said stalk rolls.

24) (New) The separation element of said corn head row unit according to claim 23
wherein the knife edges of opposing flutes have a predetermined surface slope and the angle of said slopes of opposing flutes are identical.

25) (New) The separation element of said corn head row unit according to claim 22
wherein the opposing flutes are tapered along the length of the stalk roll.

26) (New) The separation element of said corn head row unit according to claim 22
wherein the opposing flutes intermesh.

27) (New) The separation element of said corn head row unit according to claim 25
wherein the radius of the opposing flute surfaces is reduced in discrete increments along the length of the stalk roll.

28) (New) The separation element of said corn head row unit according to claim 26 wherein the opposing flutes surfaces have a plurality of radii along the length of the stalk roll.

29) (New) The separation element of said corn head row unit according to claim 26 wherein said flutes edges are tapered along the length of the stalk roll to decrease the width of the gap between said stalk rolls.

30) (New) A stalk roll for a corn harvesting header, the stalk roll comprising:

- a cylindrical shell having a central longitudinal axis;
- longitudinal integral flutes extending radially from the shell, the flutes are substantially parallel to the central longitudinal axis, each flute is provided with a knife edge, each knife edge has a leading surface and a trailing surface, said leading and trailing surface forming an acute angle; and,
- means for mounting the shell to a drive shaft of a corn harvesting header.

31) (New) A stalk roll as defined by claim 30 wherein the cylindrical shell is provided with six flutes.

32) (New) A stalk roll as defined by claim 31 wherein the cylindrical shell comprises two semi-cylindrical pieces, each semi-cylindrical piece having three flutes.

33) (New) A stalk roll as defined by claim 32 wherein the means for mounting comprises at least two bolt holes formed in each semi-cylindrical piece and associated bolts for clamping the semi-cylindrical pieces about the drive shaft of the corn harvesting head.

34) (New) A stalk roll as defined by claim 30 wherein each knife edge is self-sharpening.

35) (New) A stalk roll as defined by claim 30 wherein the trailing surface is coated with tungsten carbide.

36) (New) A pair of adjoining stalk rolls for a corn header, the adjoining stalk rolls defining a harvesting gap, each stalk roll comprising:

a cylindrical shell having a central longitudinal axis;

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longitudinal integral flutes extending radially from the shell, the flutes are substantially parallel to the central longitudinal axis, each flute is provided with a knife edge, each knife edge has a leading surface and a trailing surface, the leading surface forming an acute angle with the trailing surface; whereby the flutes of the pair of adjoining stalk rolls are offset to one another.

- 37) (New) A pair of adjoining stalk rolls as defined by claim 36 wherein each knife edge is self-sharpening.
- 38) (New) A pair of adjoining stalk rolls as defined by claim 37 wherein each of the cylindrical shells is provided with six flutes.
- 39) (New) A pair of adjoining stalk rolls as defined by claim 36 wherein each cylindrical shell comprises two semi-cylindrical pieces, each semi-cylindrical piece having three flutes.
- 40) (New) A pair of adjoining stalk rolls as defined by claim 38 wherein the opposing flutes are tapered.